

**REMARKS**

**RELATIONSHIP TO PARENT APPLICATION SERIAL NO. 09/712,818:**

This application is a Continuation-in-Part Application of U.S. Patent Application Serial No. 09/712,818 (the "parent application"). The claims of these two applications as filed are substantially identical in scope. During the prosecution of the parent application, the Examiner required restriction between three groups of claims. Group (I) is drawn to a device comprising a substrate, Group (II) is drawn to an apparatus comprising a reader and a means for attaching biomolecular moieties, and Group (III) is drawn to a method for attaching molecular moieties to a surface, respectively. Group (I) was elected without traverse.

The parent application is expressly abandoned on even date herewith in favor of this continuation-in-part. In order to expedite prosecution, the applications have cancelled those claims of this application corresponding to the nonelected claims in the parent application and reserve the right to file a divisional application under 35 U.S.C. §121 directed to the to the nonelected subject matter.

**THE AMENDMENTS AND NEW CLAIMS:**

As an initial matter, the specification has been amended to correct minor typographical errors that had resulted in the misidentification of U.S. Patent Nos. 5,784,214 to Nova et al. and 5,935,785 to Reber et al. These minor corrections in no way introduce new matter.

With respect to the claims, independent claims 1 and 45 have been amended to recite that the machine-readable information of the device is represented by no less than about 1 kilobyte of data that is physically associated with the substrate. Support for this amendment is on page 17, lines 26-28, on page 23, lines 28-30, and in claim 10 as originally filed. Claim 10 has been canceled accordingly to eliminate redundancy. In addition, it should be noted that the term "represented," as used in this context, should not be considered either an indefinite or a "nonspecific relational phrase" (as suggested by the Examiner in the prosecution of the parent application) because claims set forth that the data representing the machine-readable information is "physically associated with the substrate."

Dependent claims 2-5, 11, 13-18, 42, and 43 have been rewritten to clarify the inventive subject matter generally in accordance with the Examiner's suggestions in the Office Action on the parent application mailed on November 29, 2001 (Paper No. 5), and to replace functional language with positively recited structural elements.

New dependent claims 91-102 have been added. These claims are similar to claims 85-119 submitted in an Amendment Under 37 C.F.R. §1.111 for the parent application on February 28, 2002.

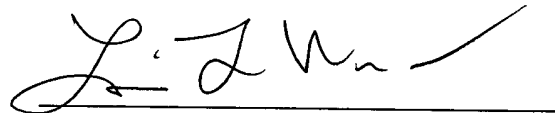
Claims 91-93 recite the physical relationship between the substrate surface and the location of the machine-readable information. This is supported in claim 1 as originally filed. Claim 94 is directed to a device wherein *the discrete region of the substrate is movable with respect to the surface to which the moieties are attached*, and claim 95 recites that the substrate comprises a cartridge. Support for this claim may be found on page 21, line 3, to page 22, line 9, as well as in FIG. 2. Claim 96 recites that *the machine-readable information exhibits positional correspondence with respect to attached moieties*. This claim finds support on page 20, line 18, to page 21, line 2. Claim 97 sets forth that *the substrate has a radial mass distribution that is symmetric about an axis perpendicular to the plane of the substrate surface*, and claim 98 recites that the substrate is in the form of a disk. This is supported on page 19, line 20, to page 20, line 6. Claim 99 is directed to a device having machine-readable information contained in a computer microchip. This claim is supported on page 23, lines 5-25. Finally, claim 100 sets forth a device containing *the machine-readable information in a medium capable of emitting radiation*, and claims 101 and 102 recite that the radiation may be electromagnetic radiation and that the medium may be a fluorescent material. Support for these claims may be found on page 24, line 26, to page 25, line 9.

Thus, no new matter has been introduced by way of any these amendments or new claims.

Should the Examiner have any questions concerning this communication, she is welcome to telephone the undersigned attorney at (650) 330-0900.

Respectfully submitted,

By:



Louis L. Wu

Registration No. 44,413

REED & ASSOCIATES  
800 Menlo Avenue, Suite 210  
Menlo Park, California 94025  
(650) 330-0900 Telephone  
(650) 330-0980 Facsimile

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**APPENDIX A**

**REDACTIONS INDICATING AMENDMENTS MADE TO THE SPECIFICATION**  
**(UNDERLINING INDICATES ADDITIONS, ~~STRIKETHROUGH~~ INDICATES DELETIONS)**

Please amend the paragraph in the specification on page 2, line 27, to page 3, line 20, as follows:

There are a number of patents describing integrated devices that contain both surface-bound chemical moieties and related information in machine-readable format. For example, U.S. Patent No. 6,030,581 to Virtanen describes an optical disk that is readable by a CD-ROM or DVD reader, wherein the disk has a first sector with a substantially self-contained assay means for reacting with an analyte and a second sector containing a control means for conducting the assay. As another example, U.S. Patent No. ~~5,872,214~~5,874,214 to Nova et al. describes a combination of a matrix with a memory means, wherein the matrix is made from materials similar to those used as supports in hybridization assays, and the memory means contains a data storage unit. As a further example, U.S. Patent No. ~~5,935,786~~5,935,785 to Reber et al. describes a support member having a first annular portion to support molecular receptors and a second annular portion to support machine-readable data that identifies each of the plurality of molecular receptors. Although these integrated devices have been described as useful in biomolecular analysis, particularly in automated assay applications, none of these patents discloses a customized array or means of formation thereof. In addition, the designs of some of these devices are not easily adapted for array formation and use. For example, the optical disks of U.S. Patent No. 6,030,581 are asymmetrically weighted about the center of the disk, thereby requiring inertial compensation if one of these disks is to be rotated about its center. Furthermore, there is a coplanar spatial relationship between the software (i.e., machine-readable information) region of the disk and the sample preparation assay region. This coplanar relationship does not allow a protective layer to be easily applied to the assay portion (e.g., by spin coating) without interfering with the software region.

**APPENDIX B**  
**REDACTIONS INDICATING AMENDMENTS MADE TO THE CLAIMS**  
**(UNDERLINING INDICATES ADDITIONS, ~~STRIKETHROUGH~~ INDICATES DELETIONS)**

1. (Amended) A device comprising a substrate having a plurality of moieties attached to a surface thereof and containing machine-readable information relating to the moieties, wherein the information is ~~contained in a discrete region of the substrate that is non-coplanar with respect to the substrate surface having the plurality of moieties attached thereto~~ represented by no less than about 1 kilobyte of data that is physically associated with the substrate.

2. (Amended) The device of claim 1, wherein the machine-readable information ~~comprises~~contains the identity of a customer.

3. (Amended) The device of claim 1, wherein the machine-readable information ~~comprises~~is secured ~~information.~~

4. (Amended) The device of claim 1, wherein the machine-readable information ~~comprises~~contains shipping and/or billing information.

5. (Amended) The device of claim 1, wherein the machine-readable information ~~comprises~~contains the identity of at least one of the moieties of the plurality of moieties attached to the device surface.

11. (Amended) The device of claim ~~109~~, wherein the machine-readable information is represented by no less than about 1 megabyte of data.

13. (Amended) The device of claim 1, wherein the machine-readable information is in a format that is optically readable.

14. (Amended) The device of claim 13, wherein the machine-readable information is in a format that is readable by a fluorescence reader.

15. (Amended) The device of claim 13, wherein the machine-readable information is in a format that is readable by a phosphoimager ~~(i.e. can detect radioactive signal produced on sensitive film)~~.

16. (Amended) The device of claim 13, wherein the machine-readable information is in a format that is readable by a compact disk reader.

17. (Amended) The device of claim 13, wherein the machine-readable information is in a format that is readable by a DVD reader.

18. (Amended) The device of claim 13, ~~wherein~~ further comprising additional the machine-readable information is in a format that is readable by a bar code reader.

42. (Amended) The device of claim 1, wherein the substrate comprises an additional magnetic medium on which additional information may be written.

43. (Amended) The device of claim 1, wherein the substrate comprises an additional optical medium on which additional information may be written.

45. (Amended) A device comprising a substrate having a surface adapted for attachment to a plurality of moieties and containing machine-readable information relating to the moieties, wherein the information is represented by no less than about 1 kilobyte of data that is physically associated with the substrate.

91. (New) The device of claim 1, wherein the information is contained in a discrete region of the substrate from the substrate surface having the plurality of molecular moieties attached thereto.

92. (New) The device of claim 45, wherein the information is contained in a discrete region of the substrate from the substrate surface adapted for attachment to a plurality of molecular moieties.

93. (New) The device of either claim 91 or claim 92, wherein the discrete region is noncoplanar with respect to the substrate surface.

94. (New) The device of either claim 91 or claim 92, wherein the discrete region of the substrate is movable with respect to the substrate surface.

95. (New) The device of claim 94, wherein the substrate comprises a cartridge.

96. (New) The device of claim 1, wherein the machine-readable information and the attached moieties exhibit positional correspondence.

97. (New) The device of either claim 1 or claim 45, wherein the substrate has a radial mass distribution that is symmetric about an axis, perpendicular to the plane of the substrate surface.

98. (New) The device of claim 97, wherein the substrate is in the form of a disk.

99. (New) The device of either claim 1 or claim 45, wherein the machine-readable information is contained in a computer microchip.

100. (New) The device of either claim 1 or claim 45, wherein the machine-readable information is stored in a medium capable of emitting radiation.

101. (New) The device of claim 100, wherein the radiation is electromagnetic radiation.

102. (New) The device of claim 100, wherein the medium is a fluorescent medium.

**APPENDIX C**  
**PENDING CLAIMS UPON ENTRY OF THIS AMENDMENT**

1. A device comprising a substrate having a plurality of moieties attached to a surface thereof and containing machine-readable information relating to the moieties, wherein the information is represented by no less than about 1 kilobyte of data that is physically associated with the substrate.
2. The device of claim 1, wherein the machine-readable information contains the identity of a customer.
3. The device of claim 1, wherein the machine-readable information is secured.
4. The device of claim 1, wherein the machine-readable information contains shipping and/or billing information.
5. The device of claim 1, wherein the machine-readable information contains the identity of at least one of the moieties of the plurality of moieties attached to the device surface.
6. The device of claim 1, wherein the machine-readable information comprises information relating to a process by which the plurality of moieties is attached to the substrate surface.
7. The device of claim 1, wherein the machine-readable information comprises information relating to experimental conditions associated with the use of the plurality of moieties.
8. The device of claim 1, wherein the machine-readable information comprises information relating to the results of an experiment associated with the use of the plurality of moieties.
9. The device of claim 1, wherein the machine-readable information is digital.
11. The device of claim 9, wherein the machine-readable information is represented by no less than about 1 megabyte of data.

12. The device of claim 11, wherein the machine-readable information is represented by about 1 to about 650 megabytes of data.

13. The device of claim 1, wherein the machine-readable information is in a format that is optically readable.

14. The device of claim 13, wherein the machine-readable information is in a format that is readable by a fluorescence reader.

15. The device of claim 13, wherein the machine-readable information is in a format that is readable by a phosphoimager.

16. The device of claim 13, wherein the machine-readable information is in a format that is readable by a compact disk reader.

17. The device of claim 13, wherein the machine-readable information is in a format that is readable by a DVD reader.

18. The device of claim 1, further comprising additional information in a format that is readable by a bar code reader.

19. The device of claim 18, wherein the bar code reader is a one-dimensional bar code reader.

20. The device of claim 18, wherein the bar code reader is a two-dimensional bar code reader.

21. The device of claim 1, wherein the machine-readable information is magnetically readable.

22. The device of claim 1, wherein the machine-readable information is electronically readable.

23. The device of claim 1, further comprising human readable information.

24. The device of claim 1, wherein the attached moieties are protected.



25. The device of claim 24, further comprising a protective layer over the attached moieties.
26. The device of claim 25, wherein the protective layer is removable.
27. The device of claim 25, wherein the protective layer allows only selected matter to be transmitted therethrough.
28. The device of claim 27, wherein the selected matter is electromagnetic radiation.
29. The device of claim 28, wherein the electromagnetic radiation has a wavelength that causes fluorescence near an attached moiety.
30. The device of claim 1, wherein the plurality of attached moieties comprises an array of biomolecules.
31. The device of claim 30, wherein the biomolecules are nucleotidic or peptidic.
32. The device of claim 30, wherein the biomolecules are oligomeric or polymeric.
33. The device of claim 30, wherein the array comprises at least about 5,000 moieties per square centimeter of substrate surface.
34. The device of claim 33, wherein the array comprises at least about 50,000 moieties per square centimeter of substrate surface.
35. The device of claim 34, wherein the array comprises at least about 200,000 moieties per square centimeter of substrate surface.
36. The device of claim 35, wherein the array comprises at least about 1,000,000 moieties per square centimeters of substrate surface.

38. The device of claim 1, wherein the substrate comprises a tape.
  39. The device of claim 1, wherein the substrate comprises a well plate.
  40. The device of claim 1, wherein the substrate comprises a slide.
  41. The device of claim 1, wherein the substrate comprises a plurality of surfaces arranged in a three-dimensional structure to which the moieties are attached
  42. The device of claim 1, wherein the substrate comprises an additional magnetic medium.
  43. The device of claim 1, wherein the substrate comprises an additional optical medium.
  44. The device of claim 1, wherein the surface having the moieties attached thereto opposes a surface on which the information is located.
  45. A device comprising a substrate having a surface adapted for attachment to a plurality of moieties and containing machine-readable information relating to the moieties, wherein the information is represented by no less than about 1 kilobyte of data that is physically associated with the substrate.
  47. The device of claim 45, wherein attachment of moieties to the surface is detectable through a signal having the same form as the machine-readable information.
  48. The device of claim 47, wherein the signal form is fluorescence.
  49. The device of claim 47, wherein the signal form is radioactivity.
  50. The device of claim 46, wherein the non-coplanar surface opposes the surface adapted for attachment to a plurality of moieties.
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91. The device of claim 1, wherein the information is contained in a discrete region of the substrate from the substrate surface having the plurality of molecular moieties attached thereto.

92. The device of claim 45, wherein the information is contained in a discrete region of the substrate from the substrate surface adapted for attachment to a plurality of molecular moieties.

93. The device of either claim 91 or claim 92, wherein the discrete region is noncoplanar with respect to the substrate surface.

94. The device of either claim 91 or claim 92, wherein the discrete region of the substrate is movable with respect to the surface to which the moieties are attached.

95. The device of claim 94, wherein the substrate comprises a cartridge.

96. The device of claim 1, wherein the machine-readable information and the attached moieties exhibit positional correspondence.

97. The device of either claim 1 or claim 45, wherein the substrate has a radial mass distribution that is symmetric about an axis, perpendicular to the plane of the substrate surface.

98. The device of claim 97, wherein the substrate is in the form of a disk.

99. The device of either claim 1 or claim 45, wherein the machine-readable information is contained in a computer microchip.

100. The device of either claim 1 or claim 45, wherein the machine-readable information is stored in a medium capable of emitting radiation.

101. The device of claim 100, wherein the radiation is electromagnetic radiation.

102. The device of claim 100, wherein the medium is a fluorescent medium.

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